

An additional variant of *Jubula hutchinsiae* subsp. *javanica* (Marchantiophyta: Jubulaceae) in Thailand

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Abstract

An additional variant of *Jubula hutchinsiae* (Hook.) Dumort. subsp. *javanica* (Steph.) Verd. is reported for Thailand based on a 2009 collection from the Nakhon Sri Thammarat province. A detailed description and illustrations are here provided.

Introduction

Jubula Dumort. (Jubulaceae) is a tropical-holarctic genus of five species including seven subspecies and two varieties (Pätsch et al. 2010, Hentschel and von Konrat 2016). The genus is characterized by (1) absence of red or brownish pigmentation, (2) *Frullania*- or *Lejeunea*-type branching, (3) entire or toothed leaves with mucronate to piliferous apices, (4) galeate lobules with a narrow stem insertion, (5) thin-walled leaf cells with minute trigones, and (6) a short, thin seta (Pätsch et al. 2010). In Thailand, only one taxon, *J. hutchinsiae* (Hook.) Dumort. subsp. *javanica* (Steph.) Verd., is known (Sukkharak 2013). The morphology of this subspecies is variable (Guerke 1978). Sukkharak (2013) reported an entire-leaved form of *J. hutchinsiae* subsp. *javanica* from Chanthaburi province. In this paper, a toothed form collected from Nakhon Sri Thammarat province is reported. The specimen is kept in Department of Biology, Faculty of Science, Burapha University.

Taxonomic discussion

Jubula hutchinsiae (Hook.) Dumort. subsp. *javanica* (Steph.) Verd., Ann. Cryptog. Exot. 1: 216. 1928. *Jubula javanica* Steph., Sp. Hepat. 4: 688. 1991.

Additional illustrations: Schiffner (1893: Taf. 29 as *Jubula hutchinsiae* var. *warburgii* Schiffn.), Kamimura (1961: Fig XXXI), Guerke (1978: Figs. 23–32), Piippo (1984: Fig. 10 (m–q)), Sukkharak (2013: Fig. 1).

Plants with irregularly pinnate branches, yellowish green, without reddish pigmentation, up to 1.5 cm long × 1.4–1.7 mm wide, branches *Frullania*-type. *Rhizoids* in tufts from underleaf bases. *Leaves* incubous, attached to the stem along a J-shaped insertion line; lobe ovate, 0.8–1 × 0.4–0.5 mm, apex acuminate, dorsal margin with 5–8 triangular teeth, the teeth consisting of 3–5 cells, being 2–3 cells wide at base and ending in a row of 1–3 cells; ventral margin with 1–3 triangular teeth, the teeth consisting of 3–4 cells, being 2 cells wide at base and ending in a row of 1–3 cells; cells isodiametric, marginal cells 7–15 × 7–12 μm, median cells 21–33

$\times 15\text{--}22\ \mu\text{m}$, basal cells $28\text{--}56 \times 20\text{--}30\ \mu\text{m}$, cell walls thin, trigones minute; oil bodies unknown; leaf lobule galeate, $193\text{--}240 \times 166\text{--}180\ \mu\text{m}$; stylus filiform, 4–6 cells long. *Underleaves* contiguous, suborbicular, $0.3\text{--}0.4 \times 0.3\text{--}0.4\ \text{mm}$, bilobed to $1/2 \times$ their length, lobe apices acuminate, sinus narrowly to widely acute, margins entire. *Gemmae* not seen. *Paroicous*. *Androecia* intercalary on lateral branches, bracts and bracteoles in 3–9 pairs. *Gynoecia* terminal with one innovation; lobe lanceolate, $0.9\text{--}1 \times 0.2\text{--}0.3\ \text{mm}$, apex acuminate, upper margin with 4–7 triangular teeth; lobules lanceolate, $2/3\text{--}1/2 \times$ lobe length, apex obtuse to acuminate, margin entire; bracteoles ovate, $1.1\text{--}1.2 \times 0.3\text{--}0.4\ \text{mm}$, bilobed to $2/3 \times$ their length, lobe apices acuminate, sinus narrow, margins in upper $1/3$ dentate, central region gibbous. *Perianth* exerted by $2/3\text{--}1/2$ total length, oblong, $1.4\text{--}1.7 \times 0.6\text{--}0.8\ \text{mm}$, 3-keeled, margin entire; beak $80\text{--}86\ \mu\text{m}$, 5–6 cells long. *Sporophyte* not seen. **Fig. 1.**



Fig. 1. Habit of *Jubula hutchinsiae* (Hook.) Dumort. subsp. *javanica* (Steph.) Verd; whole plants on left, close-up of shoot on right.

Specimen examined: Thailand, Nakhon Sri Thammarat, San Yen, on *Crepidomanes maximum* (Blume) K.Iwats. along stream, Sukkharak s.n., 11 March 2009 (Hb. Burapha Univ.).

Habitat in Thailand: Growing on the fronds of the filmy fern *Crepidomanes maximum* that was growing along the edge of a stream.

Distribution: Widely distributed across Asia and the Pacific Islands (Guerke 1978).

Notes: *Jubula hutchinsiae* subsp. *javanica* is polymorphic with respect to the dentation of lobes, bracts, and bracteoles, which vary from entire to toothed. The specimen collected Nakhon Sri Thammarat province is outstanding by its dentate leaf lobe, bract, and bracteole margins whereas the one reported from Chanthaburi province by Sukkharak (2013) has entire margins. *Jubula hutchinsiae* subsp. *javanica* is morphologically very similar to *J. hutchinsiae* subsp. *hutchinsiae* but the former differs from the latter by its light green or yellowish green pigmentation (blackish-green in subsp. *hutchinsiae*) and its geographical range in the tropics versus temperate for that of subsp. *hutchinsiae*. *Jubula hutchinsiae* subsp. *javanica* may also be confused with *J. kwangsiensis* C.Gao et K.C.Chang. However, *J. kwangsiensis* differs by its leaf lobe apex bearing three teeth (Chang and Gao 1984).

Jubula species have a high degree of morphological plasticity and have been variously circumscribed by several taxonomists (Pätsch et al. 2010). Although the genus was first revised on a world-wide basis by Guerke (1978), and relationships between subspecies of *J. hutchinsiae* were reconstructed using nuclear and chloroplast DNA markers (Pätsch et al. 2010), relationships between species within the genus remain unresolved. As previously stated by Schuster (1992), *Jubula* requires a comprehensive world-wide revision.

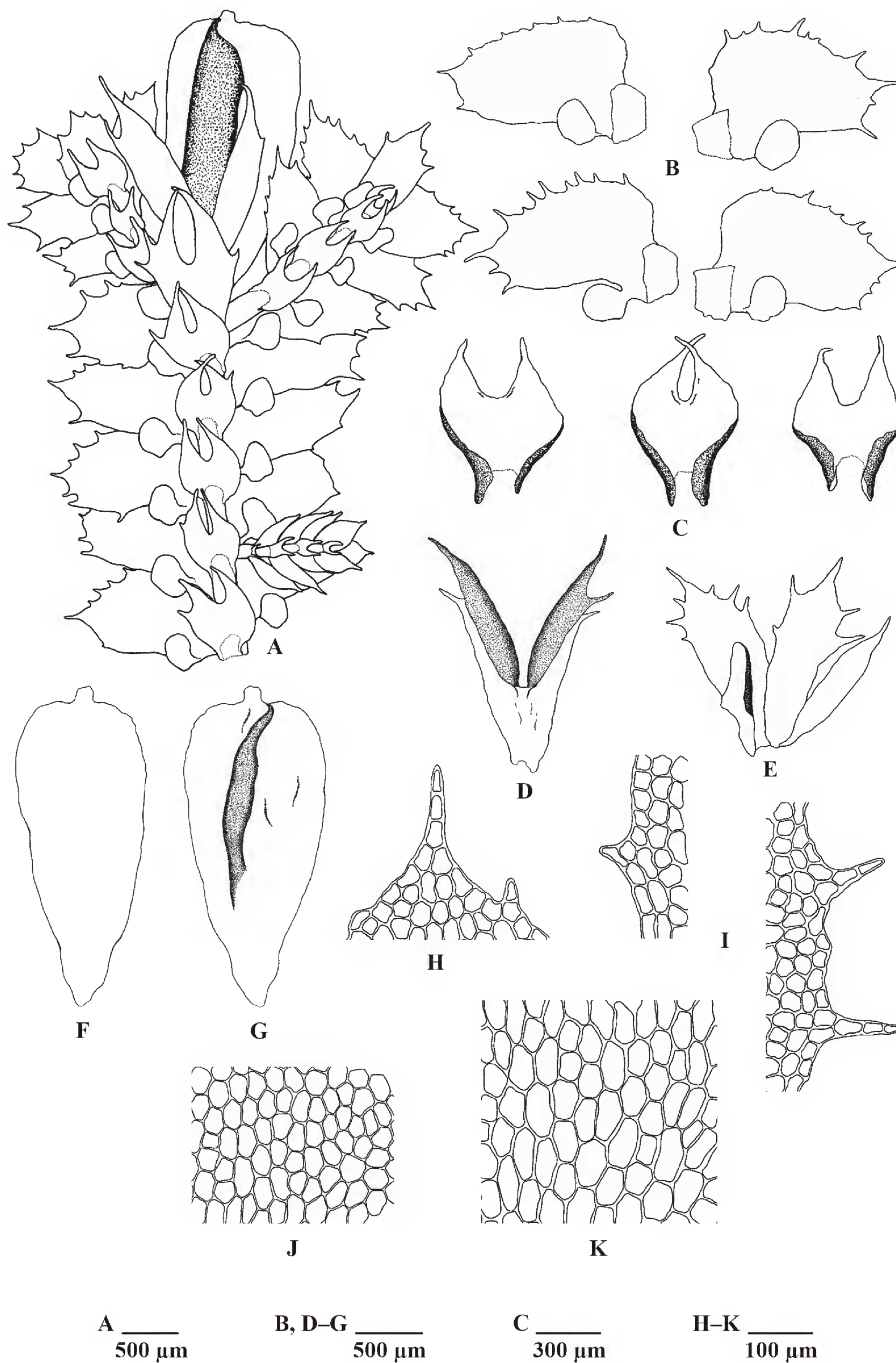


Fig. 2. *Jubula hutchinsiae* (Hook.) Dumort. subsp. *javanica* (Steph.) Verd. **A**, ventral view of the shoot showing one terminal gynoecium and lateral androecium arising on a *Lejeunea*-type branch; **B**, ventral view of leaves; **C**, underleaves; **D**, female bracteole; **E**, female bracts; **F**, dorsal view of perianth; **G**, ventral view of perianth; **H**, leaf apex; **I**, marginal cells of leaf lobe; **J**, median cells of leaf lobe; **K**, basal cells of leaf lobe. All drawn from *Sukkharak s.n.*, Hb. Burapha Univ.

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